

WHAT IS CLAIMED IS:

1. A method of sharing information among a plurality of
5 stations on a communications network, each of the plurality of
stations being capable of transmitting and receiving frames over
the communications network between any one station and all other
stations, comprising:

10 establishing a group of agreed-upon flags, each flag of
which may be set or not set by a station of the
communications network at any given time;

15 providing periodic timing in each station that expires after
an interval, the interval being common among all the
stations and being at least long enough to allow every
station on the communications network to transmit a
plurality of frames;

20 defining a common frame format providing the capability of
specifying a current transmit flag set, an old transmit flag
set, and a current receive flag set;

maintaining by each station:

25 a current transmit state set indicating by the agreed-
upon flags the current capabilities and status flags
for that station,

30 a recent timer expiration set indicating by the
agreed-upon flags the capabilities and announced
status flags for that station as they were at a most
recent expiration of the periodic timing,

35 a previous timer expiration set indicating by the

5 agreed-upon flags the capabilities and status for that station as they were at a penultimate expiration of the periodic timing,

10 a current transmit received set indicating by the agreed-upon flags a logical union of all copies of the current transmit flag set received in frames from other stations, and

15 a previous received set indicating by the agreed-upon flags the current transmit received set at the most recent expiration of its timer; and

generating a control frame by a transmitting station wherein:

20 the current transmit flag set is set to a logical union of the current transmit state set and the recent timer expiration set,

25 the current receive flag set is set to a logical union of the current transmit received set and the previous received set, and

the old transmit flag set is set to the value of the previous timer expiration set,

30 the control frame being generated and transmitted by the transmitting station to all other stations on the communications network each time a flag in any of the logical unions is set or cleared and upon the expiration of the timer in the transmitting station.

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2. The method of Claim 1 further comprising maintaining by each station a current in use set indicating by the agreed-upon flags a logical union of the current transmit state set, the recent timer expiration set, the current transmit received set, and the previous received set, the current in use set being common to all stations, except temporarily during changes in the overall set of shared flags.

3. The method of claim 1, wherein the agreed-upon flags include a flag indicating transmitting station priority.

4. The method of Claim 1, wherein the agreed-upon flags include a flag indicating transmitting station configuration.

5. The method of Claim 1, wherein the agreed-upon flags are encoded in arrays of bits set to 0 or 1, with logical functions performed as bitwise operations on the arrays.

6. The method of Claim 1 wherein the common frame format includes fields for values other than status flags, plus an identifier for a source sending station, the values being filled in by each source sending station and transmitted to all other stations.

7. The method of Claim 1, wherein a station, upon receiving a frame containing the current transmit flag set, the old transmit flag set and the current receive flag set,

detects that a flag which was previously set by at least one station is no longer set by any station, and

upon detection of a flag no longer set by any station, a receiving station clears the flag in its current transmit received set and its previous received set.

8. The method of claim 7, wherein detection of a flag no longer
set by any station is performed by a set of logical operations
5 upon the values in a received frame.

9. The method of claim 1, further comprising generating and
transmitting a second copy of the control frame being generated
and transmitted whenever a flag changes in the current transmit
10 flag set.

10. The method of Claim 1 wherein the control frame includes
status flags determinative of one or more of:

15 a version of protocol under which the communications network
is operating,
optional feature support,
link-layer priority usage, and
network configuration commands.

20 11. The method of Claim 1 wherein stations receiving the control
frames make operational decisions based upon the agreed-upon
flags without further interaction amongst the stations on the
communications network.

25 12. The method of Claim 1 wherein the control frame is
transmitted by a station once per minute or upon a change in
current status of the station.

30 13. The method of Claim 1 wherein a second copy of a most recent
control frame is transmitted by a station at a randomly selected
interval after a control frame is sent by the station announcing
a status change.

35 14. The method of Claim 1 wherein the control frame is sent at
a highest link layer protocol priority.

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15. The method of Claim 1 wherein the control frame includes an operation code that may be set to either a request operation code or an announcement operation code such that when a station receives the control frame with the request operation code a timer is set and the receiving station sends a control frame with an announcement operation code at the timer expiration.

10 16. A method of sharing information among a plurality of stations on a communications network, each of the plurality of stations being capable of transmitting and receiving frames over the communications network between any one station and all other stations, comprising periodically broadcasting by one station to all other stations capabilities and status announcements sent in control frames.

17. The method of Claim 16 wherein the control frames include status flags determinative of one or more of:

20 a version of protocol under which the communications network is operating,

optional feature support,
link-layer priority usage, and
network configuration commands.

25 18. The method of Claim 17 wherein stations receiving the control frames make operational decisions based upon the status flags without further interaction amongst the stations on the communications network.

30 19. The method of Claim 16 wherein the control frames are transmitted by a station once per minute or upon a change in current status of the station.

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20. The method of Claim 16 wherein a second copy of a most
recent control frame is transmitted by a station at a randomly
5 selected interval after a control frame is sent by the station
announcing a status change.

21. The method of Claim 16 wherein the control frames are sent
at a highest link layer protocol priority.

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22. The method of Claim 16 wherein the control frame includes
an operation code that may be set to either a request operation
code or an announcement operation code such that when a station
receives the control frame with the request operation code a
15 timer is set and the receiving station sends a control frame with
an announcement operation code at timer expiration.

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